adult fleas. However, existing adult fleas and flea pupae are not affected. An adulticide to control adult fleas may be necessary for immediate relief. Quarterly applications of methoprene to areas which may harbor fleas such as carpets, furniture and pet's sleeping areas, may be necessary once initial treatment has been conducted with a conventional insecticide.

Flea Control on Pets

The regular inspection of pets, especially during peak flea season, is essential. Look for the presence of 'flea dirt' (black particles the size of milled pepper) on the skin. Use a registered product for the control of fleas once an infestation has occurred. Before using a product, read the label carefully and consult with a veterinarian to determine the best method of treatment.

➤ Flea combs are very effective tools in the suppression of adult fleas. They allow hair to pass through the tines but not the fleas, removing fleas as well as flea feces and dried blood. Focus combing on those parts of the pet where the most fleas congregate, usually the neck or tail area. When fleas are caught, deposit them in hot soapy water to kill them.

➤ Flea collars will prevent fleas from biting your pet. They do not, however, provide adequate control once an infestation has occurred. Some animals may develop a skin rash from flea collars.

➤ Powders are not as effective for pets with thick, matted fur or a heavy undercoat.

➤ Foams may be preferable to sprays for nervous pets, especially cats.

➤ Flea shampoos will kill fleas on direct contact but provide little residual control. Giving the animal an occasional bath in soap and water can therefore be useful in reducing a flea population. Dogs are generally more amenable to bathing than cats.

➤ A micro-encapsulated (slow-release) pyrethrin spray is available through veterinarians and provides effective long-term control of fleas.

➤ Oral medication is available that leaves a residue in the pet's bloodstream that is toxic to fleas when they bite. Since some pets are allergic to flea bites, some veterinarians consider this method to be less desirable.

➤ Treatment for tapeworm infestations may be required, as fleas carry the intermediate form of this parasite. Consult your veterinarian for further information.

Read all label instructions carefully to prevent any possible toxic over-exposure of an insecticide to your pet. It is equally important to keep the amount and combination of different chemical exposures to a minimum, especially if pets are already taking some form of medication.

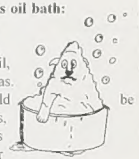
Other Methods of Control

The following methods of control can be found in published literature and are reported by some to be effective. However, these are not recognized methods of flea control as no scientific evidence exists to demonstrate their safety, merit and value.

Vacuuming a pet to remove any fleas from its fur may be effective. This is apparently something a pet can learn to enjoy.

Moth crystals in vacuum cleaner bag: Placing moth crystals, crushed mothballs or cut-up flea collars in vacuum cleaner bags has sometimes been recommended to kill fleas sucked up by the vacuum and is believed by some to have a fumigant effect. Vacuum cleaner bags should always be discarded outside of the home after use or wrapped in a plastic bag and stored in the freezer between uses. Mothballs should only be used in a small enclosed space such as a drawer, box or vacuum cleaner bag. Use mothballs only where they are inaccessible to children.

Pennyroyal or eucalyptus oil bath: Another option is to bathe the pet in water containing pennyroyal or eucalyptus oil, which supposedly kills fleas. Badly-infested dogs should be bathed every two weeks, while cats need this treatment only once per month.



Garlic or brewer's yeast may also be added to the pet's daily diet, as they reportedly repel fleas.

Ultrasonic devices: There is currently no evidence to suggest that ultrasonic devices work to control fleas.

Remember

Before Purchasing a Pesticide Product

➤ Identify the pest correctly.

➤ Use physical control methods and alternatives to pesticides.

➤ Read the label directions and safety precautions before buying the product. The label must include the name of the pest to be controlled and the treatment location (e.g., indoor, outdoor, garden uses, pet treatment).

➤ Purchase only the quantity of product needed for the treatment.

➤ Alternatively, you may choose to hire a licensed pest control operator.

When Using a Pesticide

➤ Carefully read all label instructions and precautions before using pesticides.

➤ Do not drink, eat or smoke while applying pesticides.

➤ Persons and pets should vacate the area during treatment. Cover or remove aquaria.

➤ If kitchen area is to be treated, cover or remove food, dishes and utensils.

After Handling a Pesticide

➤ Always wash your hands thoroughly after handling any pesticide product.

➤ Do not permit persons or pets to contact treated surfaces until residue has dried completely.

➤ Provide adequate ventilation of treated areas after use.

➤ Wipe clean all surfaces that comes in direct contact with food, such as counters, tables and stovetops, including indoor and outdoor surfaces.

➤ Always store pesticides out of reach of children and pets and away from food and beverages.

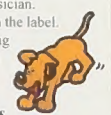
In Case of Accidental Poisoning

➤ Call a poison control centre immediately and seek medical attention.

➤ Take the pesticide container or label with you to the emergency facility or physician.

➤ Follow first aid statements on the label.

➤ In case of accidental poisoning of pets seek veterinary attention immediately.



When Disposing of Pesticides

Do not reuse empty pesticide containers. Wrap and dispose of in household garbage.

Unused or partially used pesticide products should be disposed of at provincially or municipally designated household hazardous waste disposal sites.

Use Common Sense

➤ These are general recommendations.

➤ Consult the label for specific instructions.

➤ When in doubt, contact a professional.

Pest Management Regulatory Agency
2250 Riverside Drive
Ottawa ON K1A 0K9

Pest Management Information Service
Telephone: 1-800-267-6315
From outside Canada: (613) 736-3799*
*Long distance charges apply.
Fax: (613) 736-3798
Internet: www.hc-sc.gc.ca/pmra-arla

Canada

Effective Control of Fleas

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Effective Control of Fleas

April 1997
Reformatted April 1999

It is a common fallacy that all cats and dogs have fleas. Most of these animals can be kept free of fleas if basic hygienic practices are followed.

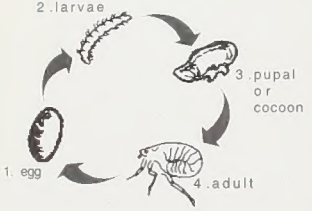
Fleas are a common pest of many types of animals, including humans. While cats and dogs are the primary hosts of fleas in and around the home, humans can often become secondary hosts in the absence of domestic pets. A female flea can lay 25 eggs per day, producing approximately 800 eggs in its life. Although fleas usually feed several times a day on animals, they can survive several weeks without a meal. Adult fleas usually leave the host after feeding; however, flea eggs, larvae or pupae may be found on pets.

The peak season for flea infestations outdoors in most parts of Canada is from early August to early October. In excessively dry, hot summers flea populations tend to decrease; fleas are unable to retain moisture and they dehydrate and die.

Only female fleas bite. The bites cause the formation of a small, hard, red, itchy spot on the skin. When the flea pierces the skin with its mouthparts, it injects a salivary secretion to prevent its host's blood from clotting. The itchiness is due to a reaction of the body's immune system to substances in the salivary secretions. Reactions are specific to each individual; some may be more affected than others. To relieve the itchiness, apply ice cubes or calamine lotion to the bite.

Lifecycle

Fleas have four stages of development: egg, larval, pupal and adult. The life cycle varies depending on the flea species, temperature, humidity and the availability of food. The optimum development period from egg to adult is two to three weeks; however, when conditions do not favor rapid development the cycle may take several months.



Egg Stage
After each blood meal, female fleas lay four to eight smooth, round, light-coloured, sticky eggs. Eggs laid on a host can easily fall or be brushed off. High concentrations are usually present in pet bedding, boxes or kennels.

Larval Stage
Eggs hatch into very small, hairy, wormlike larvae that are whitish with brownish heads. The larvae are about 1.5 mm long and may grow to 5 mm. During this time they avoid light and are sensitive to changes in humidity and temperature. Flea larvae feed on organic debris, their own cast skins and on dried blood present in the excrement of adult fleas. Larvae can survive for up to 200 days in unfavourable conditions and can travel distances of up to 30 cm per minute. Flea larvae will coil around the nearest object, often carpet fibres, in order to avoid the suction of a vacuum.

Pupal Stage
In the third stage of development, flea larvae spin silken cocoons covered with particles of dust, fibres, sand and organic debris. Within this cocoon, the larvae metamorphose in the shape of adult fleas. They are white in colour at the onset and change to brown before emerging.

Adult Stage
Adult fleas are small, dark brown or reddish brown insects ranging in length from 1 to 4 mm. Their bodies are flattened from side to side allowing them to move easily through hair or fur. Although they are wingless, their stout hind legs are well adapted for jumping. Fleas can jump a maximum distance of 20 cm vertically and 41 cm horizontally. Their comb-like, spiny legs make it difficult to detach fleas from a host.

Adult fleas may remain in the pupal chamber for several months until favorable conditions, such as increased temperature and carbon dioxide concentrations, favor their emergence. Vibrations indicating the presence of a host also stimulate their emergence. This explains why fleas in unoccupied homes become active as soon as humans or pets re-enter.

How to Control Fleas in and Around the Home

The following tips may help to reduce or eliminate flea infestations significantly. To break the flea cycle successfully the homeowner must rely on a combination of thorough sanitary practices and chemical treatments.

Sanitation
Vacuuming on a daily basis to remove eggs, larvae and adults is the best method to gain initial control of a flea infestation. It is important to include the following areas: carpets, cushioned furniture, cracks and crevices on floors and along baseboards, and the basement. Steam cleaning carpets may also help as the hot steam and soap can kill fleas in all stages of the life cycle. Pay particular attention to areas where pets sleep.

Wash all pet bedding and family bedding on which pets lie in hot, soapy water every two to three weeks. This is an important step in flea control as adults may lay eggs on the host, which then fall off in those areas where pets rest. Lift blankets by all four corners to avoid scattering the eggs and larvae. If an infestation is severe, discard old pet bedding and replace it with fresh, clean material.

Chemical Control
Treatment with an insecticide is usually required to suppress a severe infestation of fleas. There are numerous flea products registered for use in Canada. Since their formulations and uses may vary it is important to read label directions carefully before purchasing and using a product.

While insecticides do not control flea eggs, they will control adult fleas and flea larvae. A repeat treatment is therefore often required to break the cycle. As a general rule, reapplication of a residual insecticide is not required within a 14-day interval. Retreat only if necessary or as indicated on the product label.

Fleas and flea larvae tend to hide in dark corners, behind and under furniture, under the edges of area rugs, in cracks and crevices along baseboards, floorboards, heating vents and in areas where the ground is shaded and moist. If recommended on the label, treat areas such as pet sleeping quarters.

When using a flea product registered for use on mattresses, do not treat sheets or blankets. Washing them in hot water will kill existing fleas, eggs and larvae.

Treat around doors, window frames and foundations, with a residual insecticide to help prevent entry into the home. Check all screens to ensure they are in good repair. Treatment of the yard and around the outdoor resting and play areas of pets should be considered as part of the overall flea control program. Cover children's sandboxes when not in use.

Flea control products registered in Canada for use by homeowners or professional exterminators include chemicals such as bendiocarb, carbaryl, chlorpyrifos, propoxur, diazinon and malathion. These are indicated on the label under the heading "guarantee". Other insecticides are derived from natural sources such as diatomaceous earth, pyrethrins, boric acid and rotenone. Some products may contain a combination of both chemical and naturally derived insecticides.

The following provides information on some of the active ingredients registered for use against fleas.

A general surface treatment with **bendiocarb** by a professional exterminator is effective against fleas. Bendiocarb is formulated as a wettable powder. Once diluted in hot water it can be applied lightly between and under cushions of upholstered furniture, to rugs, and floor coverings.

Boric acid, a chemical of lesser toxicity to humans, can be used to control fleas. Domestic users can purchase the dust form of the product which should be applied as a light coating. If the coating is too thick, the insect will simply avoid going in its path. The paste form is available to pest control operators for treatment of cracks and crevices.

Boric acid, a stomach action poison, is ingested while the insects clean themselves. Applied where the insects are likely to be, it takes about 10 days to be effective. Boric acid may be effective for many years when treated areas are kept dry.

Diatomaceous earth, a fine powder also known as silicon dioxide, consists of marine microorganisms. As the insects crawl over the fine powder, their waxy outer protection is scratched, causing them to dehydrate and die. Diatomaceous earth is non-toxic to humans and pets and will remain active as long as it is kept dry once applied.

Silica aerogel is usually combined with pyrethrin. The pyrethrin component provides a quick knockdown of the insects while silica aerogel works like diatomaceous earth.

The insect growth regulator **methoprene** acts on the immature life stages of fleas, preventing adults from developing and emerging.

Methoprene imitates an essential insect juvenile hormone. Flea eggs deposited on, and larvae crawling onto, treated areas will not develop into adult fleas. However, adult fleas and flea pupae are not affected. Therefore, an adulticide to control adult fleas may be necessary. Methoprene is effective for three to seven months and is considered to be of very low toxicity to humans. It can be used safely inside infested rooms.

Pyrethrin, an insecticide derived from the dried flower heads of chrysanthemums, can be used on many surfaces. While most pyrethrin products provide a rapid knockdown of adult fleas, they lack the residual activity necessary for complete control. However, a micro-encapsulated pyrethrin formulation is available which allows the insecticide to be released slowly over a longer period of time. These products are generally sold by veterinarians. Vacuuming of treated surfaces after this product is applied will reduce its efficacy. Pyrethrin products have a very low toxicity for humans and pets; however, they may cause an allergic reaction in some individuals. Other micro-encapsulated products containing diazinon or chlorpyrifos are available for crack, crevice and spot treatment only.

Active ingredients such as **permethrin** and **d-trans allethrin**, also registered for the control of fleas, are synthetic copies of pyrethrum and act on the pest in the same way.

Flea Growth Regulators

The use of the insect growth regulator "methoprene" acts on the immature life stage of fleas, preventing adults from developing and emerging. Flea eggs deposited on, and larvae crawling onto treated areas will not develop into